SARI

Lapangan "Haq" terletak di Kabupaten Rokan Hulu, Riau merupakan salah satu lapangan produksi minyak di Cekungan Sumatra Tengah, Wilayah Kerja Dua dan Tiga, Blok Rokan, PT Pertamina Hulu Rokan. Lapangan ditemukan pada Juli 1975 dan mulai produksi sejak April 1983 dengan target reservoir pada Formasi Menggala, Bekasap, dan *Upper Red Bed*. Penelitian dilakukan untuk mengetahui karakteristik geologi, fasies, lingkungan pengendapan, geometri, persebaran, dinamika vertikal, dan lateral melalui data satu sumur data biostratigrafi, satu sumur batuan inti Formasi Menggala, dan empat belas data log sumur pada Lapangan "Haq", Cekungan Sumatra Tengah. Pengembangan studi fasies dan lingkungan pengendapan dilakukan untuk mengetahui lokasi prospek elemen *petroleum play* dan tahap berikutnya dalam pembuatan model statik. Metode analisis meliputi analisis biostratigrafi, analisis litofasies, analisis elektrofasies, korelasi stratigrafi, korelasi struktur, dan ketebalan reservoir (*gross sand* dan *net sand)*. Model fasies divalidasi menggunakan data geologi yaitu *sidewall core*, salinitas air, dan data reservoir yaitu produksi, *pressure*, dan *completion history.*

Berdasarkan data tampilan hidrokarbon Kelompok Pematang hingga Formasi Petani terdapat lima *sand* reservoir minyak sebagai target penelitian yaitu *Sand* Bekasap A (BA), Menggala A (MA), Menggala B (MB), Menggala E (ME), dan Menggala F (MF). Analisis biostratigrafi didapatkan fosil foraminifera, nanofosil, dan palinomorf berumur Miosen Awal – Miosen Akhir, lingkungan pengendapan *supratidal – outer neritic*, sembilan *sequence boundary* dari Kelompok Pematang, Formasi Menggala, Bangko, Bekasap, Duri, Telisa, dan Petani dengan sikuen stratigrafi didominasi transgresi sampai Formasi Telisa, kemudian regresi. Analisis litofasies batuan inti dan integrasi batuan inti ke log reservoir ME didapatkan lima litofasies yaitu M1, S3, S4, S5, S6. Korelasi stratigrafi dan struktur regional berdasarkan sembilan *sequence boundary* Kelompok Pematang – Formasi Petani dengan lingkungan pengendapan *supratidal – inner neritic*. Korelasi stratigrafi dan fasies reservoir pada Formasi Menggala – Formasi Bekasap dan dibuat peta *gross sand, net sand* dan peta fasies pada lima *sand* reservoir penelitian dengan asosiasi fasies *fluvial channel*, *tidal flat*, *sand sheet*, *subtidal bar*, dan *marine shale*. Lapisan *sand* MA, MB, ME, dan MF terdiri dari asosiasi fasies *fluvial channel* dengan fasies *fluvial channel axis, fluvial channel margin,* dan *fluvial floodplain* berarah Barat Laut - Tenggara. Lapisan *sand* BA dengan asosiasi fasies *subtidal bar* dan *marine shale* dengan fasies *subtidal bar axis, subtidal bar margin* dan *marine shale* berarah Timur Laut – Barat Daya. Validasi model fasies sesuai dengan konsep *thick widthness ratio* dari data *outcrop analog modern dataset*, bagian *axis* terdiri atas butiran relatif lebih kasar, bagian *off-axis* relatif lebih halus, salinitas air pada Formasi Menggala <1000 ppm penciri air tawar terdapat perbedaan *pressure* dan produksi pada perbedaan fasies.

Kata kunci: Fasies Dan Lingkungan Pengendapan, Formasi Bekasap, Formasi Menggala, Validasi Geologi, Validasi Reservoir.

ABSTRACT

The "Haq" field located in Rokan Hulu Regency, Riau is one of the oil production fields in the Central Sumatra Basin, Working Area Two and Three, Rokan Block, PT Pertamina Hulu Rokan. The field was discovered in July 1975 and started production in April 1983 with target reservoirs in Menggala, Bekasap, and Upper Red Bed Formations. The research was conducted to determine the geological characteristics, facies, depositional environment, geometry, distribution, vertical and lateral dynamics through data from one biostratigraphic data well, one Menggala Formation core rock well, and fourteen well log data in the "Haq" Field, Central Sumatra Basin. The development of facies and depositional environment studies was carried out to determine the prospect location of petroleum play elements and the next stage in static modeling. Analysis methods include biostratigraphic analysis, lithofacies analysis, electrofacies analysis, stratigraphic correlation, structural correlation, and reservoir thickness (gross sand dan *net sand). The facies model was validated using geological data, such as sidewall core, water salinity, and reservoir data, such as production, pressure, and completion history.*

Based on the hydrocarbon display data of Pematang Group to Petani Formation, there are five sand oil reservoirs as research targets, Bekasap A Sand (BA), Menggala A (MA), Menggala B (MB), Menggala E (ME), and Menggala F (MF). Biostratigraphic analysis obtained fossil foraminifera, nannofossils, and palynomorphs of Early Miocene - Late Miocene age, supratidal - outer neritic depositional environment, nine sequence boundaries from Pematang Group, Menggala, Bangko, Bekasap, Duri, Telisa, and Petani Formations with stratigraphic cycles dominated by transgression to Telisa Formation, then regression. Analysis of core rock lithofacies and integration of core rock to ME reservoir logs obtained five lithofacies such as M1, S3, S4, S5, S6. Stratigraphic correlation and regional structure based on nine sequence boundary of Pematang Group - Petani Formation with supratidal - inner neritic depositional environment. Stratigraphic and reservoir facies correlation of Menggala Formation - Bekasap Formation and created gross sand, net sand and facies maps of five sand reservoirs with facies associations of fluvial channel, tidal flat, sand sheet, subtidal bar, and marine shale. The MA, MB, ME, and MF sand layers consist of fluvial channel facies associations with fluvial channel axis, fluvial channel margin, and fluvial floodplain facies in the northwest - southeast direction. BA sand layer with subtidal bar and marine shale facies association with subtidal bar axis, subtidal bar margin and marine shale facies in northeast - southwest direction.. The validation of the facies model is in accordance with the concept of thick widthness ratio from the modern analog outcrop data dataset, the axis part consists of relatively coarser grains, the off-axis part is relatively finer, the water salinity in the Menggala Formation is <1000 ppm of fresh water characteristics, there are differences in pressure and production in different facies.

Keywords*: Facies and depositional environment, Bekasap Formation, Menggala Formation, geological validation, reservoir validation.*